

WE CLAIM:

1. A method for desorption and recovery of desorbed compounds, including the steps of:

- generating a recirculation stream of inert gas (1) which passes through the material (2) to be desorbed;
- heating said stream (1) to a temperature sufficient to cause the desorption process;
- yielding a gas effluent (3) from said recirculating stream of inert gas (1) in such a manner that said recirculated gas (1) keeps a constant pressure
- cooling said gas effluent (3) to cause condensation of the desorbed compounds contained in said gas effluent (3), said cooling being obtained at least partly by pressure vaporization of a cryogenic fluid (4);
- feeding said recirculating gas stream (1) by using at least a part of said pressure vaporized cryogenic fluid (4) that was previously used to cool at least a part of said gas effluent (3).

2. A method for desorption and recovery of desorbed compounds as claimed in claim 1, wherein the flow rate of said gas effluent (3) outflown from said recirculating gas flow (1) is below 1/50 of the flow rate of the recirculated stream (1).

3. Method for desorption and recovery of desorbed compounds as claimed in claim 1 or 2, wherein said cooling of said gas effluent (3) is obtained by means of a cryogenic condenser (5).

4. Method for desorption and recovery of desorbed compounds as claimed in claim 1 or 2 or 3, wherein said cooling of said gas effluent (3) is obtained by means of an internal reflux fractionation column (6).

5. A method for desorption and recovery of desorbed compound as claimed in any preceding claim, including the additional steps of:

- stopping the delivery of said evaporated cryogenic fluid (4), which is used to cool at least a part of the gas effluent (3), to the recirculating stream (1);
- stopping the circulation of said recirculating stream of inert gas (1);
- sucking in the recirculated gas (1) to generate a negative pressure in the bed of material to be regenerated (2), and delivering the sucked gas to said desorbed compound condensing means (5; 6).

6. A system for desorption and recovery of desorbed compounds, including:

- a vessel (16) containing a bed of adsorbent material (2);
- means (17) for generating a recirculating stream of inert gas (1) in a closed loop (8) which includes said vessel (6);
- means (9) for heating said recirculating gas stream (1) in said closed loop (8);
- a cryogenic condenser or an internal reflux fractionation column (6), which is at least partly cooled by an evaporated cryogenic fluid (4);
- a duct (10) for connecting said closed loop (8) to said cryogenic condenser (5) or said internal reflux fractionation column (6), to feed a gas effluent (3) coming from said closed loop (8) to said cryogenic condenser (5) or said internal reflux fractionation column (6);
- means (12) for delivering a part of said evaporated cryogenic fluid (4) outflowing from said condenser (5) or said fractionation column (6) to said closed loop (8).

7. A system as claimed in claim 6, which further includes:

- means (13) for stopping the feed of evaporated cryogenic fluid to said closed loop (8);
- means (14) for sucking in the gas in said closed loop (8) to generate a pressure below atmospheric in said vessel (16).